

BOTANY — PAPER-II

Time — Three hours

Full Marks — 100

Answer to Question No. 1 i.e. MCQ type questions under Section-A must be written in English only. Answers to other questions must be written either in English or in Bengali.

It must not be answered partly in English and partly in Bengali.

This instruction should be followed scrupulously.

The figures in the margin indicate full marks for the questions.

Candidates are required to give their answers in their own words as far as practicable.

SECTION — A

Answer all questions.

1. Select the single best answer and write it in the answer script putting option either

(i) or (ii) or (iii) or (iv) as applicable :

20×1=20

Example :

Question : The base which is not found in DNA is

- | | |
|--------------|--------------|
| (i) cytosine | (ii) thymine |
| (iii) uracil | (iv) adenine |

Answer : (iii) uracil

(a) Which organelles contains a gene in multiple copies ?

- | | |
|------------------|------------------|
| (i) Mitochondria | (ii) Nucleus |
| (iii) Nucleolus | (iv) Chloroplast |

(b) Tonoplast contains

- | | |
|-------------------|------------|
| (i) Glucose | (ii) Water |
| (iii) Chlorophyll | (iv) DNA |

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(c) The bond between a nitrogenous base and a pentose sugar is called

- (i) N-glycosylic bond
- (ii) Phosphodiester bond
- (iii) Hydrogen bond
- (iv) Peptide bond

(d) When adenine is attached to ribose sugar, it is called

- (i) Adenodine
- (ii) Adenosine
- (iii) Nucleotide
- (iv) Guanosine

(e) The position of a gene in the chromosome

- (i) is never fixed
- (ii) is always fixed
- (iii) fluctuates
- (iv) cannot be determined

(f) The chain-terminating condon is

- (i) UAG
- (ii) AUG
- (iii) CCC
- (iv) GGG

(g) Plasmids that can integrate into the bacterial DNA are called

- (i) Virion
- (ii) Episome
- (iii) Nucleoid
- (iv) Hyposome

(h) In genetic engineering which of the following enzymes is used to cut DNA

- (i) Helicase
- (ii) Restriction enzyme
- (iii) Ligase
- (iv) Pectinase

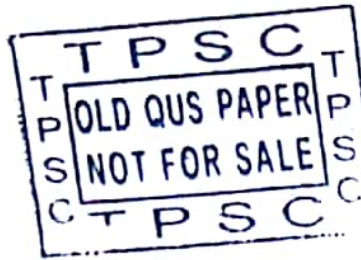
(i) 'Kranz' type of anatomy is found in the leaves of

(i) C_3 plants

(ii) C_4 plants

(iii) Both C_3 and C_4 plants

(iv) None of the above



(j) When touch is the stimulus, the response is called

(i) Chemotropism

(ii) Nastic movement

(iii) Thigmotropism

(iv) None of the above

(k) In the deserts, which type of plants are more common ?

(i) Viviparous

(ii) Root parasite

(iii) Heterophyllous

(iv) Succulents

(l) The ecosystem of a pond is referred to as.

(i) Lentic

(ii) Lotic

(iii) Xeric

(iv) Benthic

(m) World climate is threatened by increase in the concentration of

(i) Nitrogen

(ii) Carbon di-oxide

(iii) Oxygen

(iv) Water vapour

(n) Decrease in species diversity in tropical countries is mainly due to

(i) Soil erosion

(ii) Pollution

(iii) Deforestation

(iv) Urbanisation

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(3)

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(o) Acid rain is caused by water combining with environmental pollutants, such as

(i) SO_2

(iii) O_3

(ii) CO

(iv) None of these

(p) NAD and FAD are

(i) Co-enzyme

(iii) Holoenzyme

(ii) Apo-enzyme

(iv) Protein

(q) Oxidative phosphorylation occurs during

(i) Glycolysis

(iii) Electron transport

(ii) Krebs' cycle

(iv) All the three steps

(r) The raw materials for evolution comes from

(i) In breeding

(iii) Environment

(ii) Mutation

(iv) Food

(s) A super female has

(i) One X chromosome

(ii) Two X chromosome

(iii) Three X chromosome

(iv) No Y chromosome

(t) The hormone responsible for vernalization is

(i) Florigen

(iii) Vernalin

(ii) Colchicine

(iv) Absciscin

SECTION - B

Answer any *six* questions from the following.

6×5=30

2. What are called polysomes ? Give a description of ultra structure of ribosome. 1+4=5
3. Differentiate between B DNA and Z DNA. What is called c DNA ? 4+1=5
4. Comment on "One gene - one polypeptide - one phenotype" hypothesis. 5
5. What is the ratio of supplementary factor ? State why it is called a recessive epistasis. 1+4=5
6. Give an account of process of emasculation in brief. What is called heterosis ? 4+1=5
7. Name the different types of transpiration found in plants. State the role of potassium ion (K^+) in stomatal movement.
8. What is meant by seed dormancy ? Discuss about the role of seed coat to keep the seed dormant.
9. Define plant succession. Discuss about the role of Lichen in the initiation of Xerosere. What is the difference between autogenic and heterogenic succession ? 1½+2+1½=5

SECTION - C

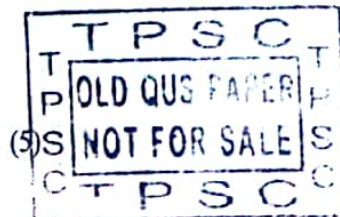
Answer any *five* questions from the following.

5×10=50

10. In what type of cells, meiosis takes place? With sketches, describe the different substages of prophase I of meiosis. What is the significance of crossing over ? 1+(5+2)+2=10

11. What is 'operon' ? Give an account of the genetic control of enzyme synthesis through the activity of Lac operon. 1+9=10

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12. Define mutation. Give an account of the bio-chemical basis of mutation. Name one chemical mutagen. $1+8+1=10$
13. What are called recombinant DNA ? Discuss the role of restriction enzyme in the formation of recombinant DNA. Write a brief note on transgenic crops. $1+5+4=10$
14. What is meant by biological fixation of N_2 ? Give an account of biochemistry of biological N_2 fixation in case of symbiotic association with special reference to gene regulation. $1+6+3=10$
15. What are synthetic hormones ? Discuss briefly the role of hormone in
- (i) weed control
 - (ii) parthenocarpic development of fruit
 - (iii) senescence and
 - (iv) control of floral initiation.
- $2+8=10$
16. What are called bio-degradable pollutants ? Give one example. Write about the ways through which air gets polluted. What is called biological oxygen demand (B.O.D.) ? $1+1+7+1=10$

